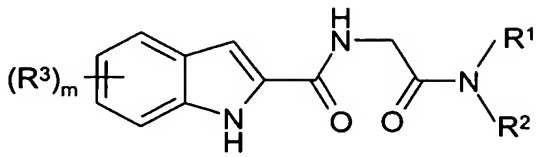
Claims

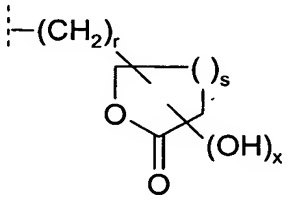
1. A compound of formula (1):



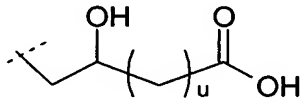
(1)

wherein

R^1 is independently selected from C_{1-6}alkyl, C_{5-7}cycloalkyl, C_{5-7}cycloalkylC_{1-3}alkyl, C_{1-6}alkoxy, C_{5-7}cycloalkoxy, C_{5-7}cycloalkylC_{1-3}alkoxy, heterocyclyl, heterocyclylC_{1-3}alkyl, heterocyclyloxy or heterocyclylC_{1-3}alkoxy (wherein each of these groups is substituted on carbon with 1, 2, or 3 hydroxy groups, provided that there is no more than one hydroxy group on the same carbon atom and a ring carbon atom adjacent to a ring heteroatom is not substituted by a hydroxy group), and groups of the formula A or A'



(A)

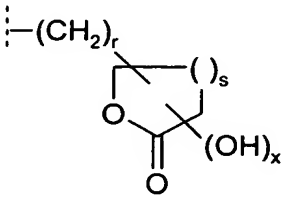


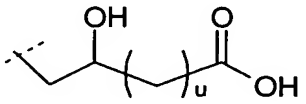
(A')

wherein x is 0 or 1, r is 0, 1, 2, or 3, s is 1 or 2 and u is 1 or 2;

provided that in (A) the hydroxy group is not a substituent on the ring carbon adjacent to the ring oxygen;

R^2 is phenyl or heteroaryl (each of which is optionally substituted with 1 or 2 substituents independently selected from halo, cyano, trifluoromethyl, difluoromethyl, fluoromethyl, C_{1-3}alkoxy, C_{1-3}alkanoyl, carbamoyl, *N*-C_{1-3}alkylcarbamoyl, *N,N*-di-C_{1-3}alkylcarbamoyl, sulfamoyl, *N*-C_{1-3}alkylsulfamoyl, *N,N*-di-C_{1-3}alkylsulfamoyl, and groups of the formulae B and B'





(B) (B')

wherein x is 0 or 1, r is 0, 1, 2, or 3, s is 1 or 2 and u is 1 or 2;
provided that the hydroxy group is not a substituent on the ring carbon adjacent to the ring oxygen);
m is 0, 1, or 2; and
R^3 is independently selected from hydrogen, halo, nitro, cyano, hydroxy, carboxy, carbamoyl, C_{1-4}alkyl, C_{2-4}alkenyl, C_{2-4}alkynyl, C_{1-4}alkoxy, C_{1-4}alkanoyl, fluoromethyl, difluoromethyl, trifluoromethyl, and trifluoromethoxy;
provided that when R^1 is of the formula A or A', then R^2 does not contain a group of the formula B or B', and when R^2 is of the formula B or B', then R^1 does not contain a group of the formula A or A';
or a pharmaceutically acceptable salt or prodrug thereof.

2. A compound of claim 1, wherein:
R^1 is selected from C_{1-6}alkyl, C_{5-7}cycloalkyl, C_{5-7}cycloalkylmethyl, C_{1-6}alkoxy, C_{5-7}cycloalkoxy, C_{5-7}cycloalkylC_{1-3}methoxy, heterocyclyl, heterocyclylmethyl, heterocyclyloxy and heterocyclylmethoxy (wherein each of these groups is substituted with 1 or 2 hydroxy groups provided that there is no more than one hydroxy group on the same carbon atom), or R^1 is of the formula A or A';
R^2 is a phenyl or heteroaryl group (each of which is optionally substituted with 1 or 2 substituents independently selected from halo, cyano, trifluoromethyl, carbamoyl, N-C_{1-3}alkylcarbamoyl, N,N-di-C_{1-3}alkylcarbamoyl, sulfamoyl, N-C_{1-3}alkylsulfamoyl, N,N-di-C_{1-3}alkylsulfamoyl, a group of the formula B, and a group of the formula B');
or a pharmaceutically acceptable salt or in-vivo hydrolysable ester thereof.

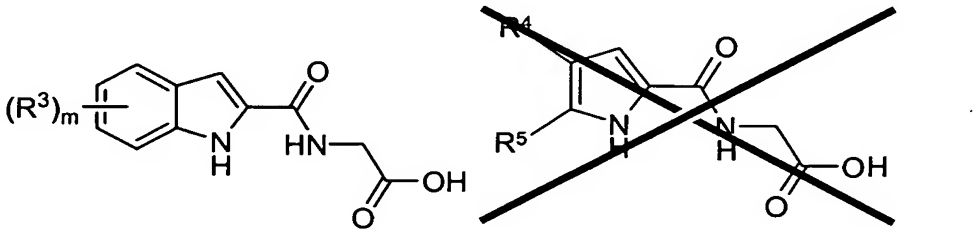
3. A compound of claim 1, wherein:
R^1 is selected from C_{1-6}alkyl, C_{5-7}cycloalkyl, C_{5-7}cycloalkylmethyl, C_{1-6}alkoxy, C_{5-7}cycloalkoxy, and C_{5-7}cycloalkylC_{1-3}methoxy, wherein each group is substituted with 1 or 2 hydroxy groups provided that there is no more than one hydroxy group on the same carbon atom;
R^2 is a phenyl or heteroaryl group (each of which is optionally substituted with 1 or 2 substituents independently selected from halo, cyano, trifluoromethyl, carbamoyl, N-C_{1-3}alkylcarbamoyl, N,N-di-C_{1-3}alkylcarbamoyl, sulfamoyl, N-C_{1-3}alkylsulfamoyl, and

N,N-di-C_{1-3}alkylsulfamoyl);
or a pharmaceutically acceptable salt or in-vivo hydrolysable ester thereof.

4. A compound of claim 1, wherein:
R^1 is selected from ethyl, propyl, cyclopentyl, cyclohexyl, cyclopentylmethyl, and cyclohexylmethyl, wherein each group is substituted with 1 or 2 hydroxy groups provided that there is no more than one hydroxy group on the same carbon atom;
R^2 is selected from phenyl, pyridyl, oxadiazolyl, oxazolyl, thiazolyl, and thienyl, each of which is optionally substituted with 1 or 2 substituents independently selected from halo, cyano, trifluoromethyl, carbamoyl, N-C_{1-3}alkylcarbamoyl, sulfamoyl, and N-C_{1-3}alkylsulfamoyl;
m is 1; and
R^3 is chloro;
or a pharmaceutically acceptable salt or in-vivo hydrolysable ester thereof.

5. A compound of claim 1, wherein:
R^1 is selected from 2-hydroxyethyl, 2,3-dihydroxypropyl, 3,4-dihydroxycyclopentyl, and 3,4-dihydroxycyclopentylmethyl;
R^2 is phenyl optionally substituted with 1 or 2 substituents independently selected from halo, cyano, trifluoromethyl, carbamoyl, N-C_{1-3}alkylcarbamoyl, sulfamoyl, and N-C_{1-3}alkylsulfamoyl;
m is 1 or 2; and
R^3 is hydrogen or halo;
or a pharmaceutically acceptable salt or in-vivo hydrolysable ester thereof.

6. A process for preparing a compound of claim 1 or a pharmaceutically acceptable salt or an in-vivo hydrolysable ester thereof, which process comprises:
a) reacting an acid of the formula (2)



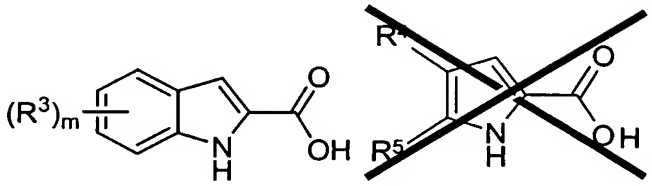
(2)

or an activated derivative thereof; with an amine of formula (3)

HNR^1R^2

(3); or

b) reacting an acid of the formula (4)



(4)

or an activated derivative thereof; with an amine of formula (5)

$H_2NCH_2CONR^1R^2$

(5)

wherein any functional groups are optionally protected;

and thereafter if necessary

i) converting a compound of the formula (1) into another compound of the formula (1);

ii) removing any protecting groups; or

iii) forming a pharmaceutically acceptable salt or in-vivo hydrolysable ester.

7. A pharmaceutical composition comprising a compound of claim 1, or a pharmaceutically acceptable salt or in-vivo hydrolysable ester thereof and a pharmaceutically acceptable diluent or carrier.

8. A method of treating type 2 diabetes, insulin resistance, syndrome X, hyperinsulinaemia, hyperglucagonaemia, cardiac ischaemia, or obesity in a warm-blooded animal in need of such treatment, comprising administering to said animal an effective amount of a compound of claim 1.

9. A method of treating type 2 diabetes in a warm-blooded animal in need of such treatment, comprising administering to said animal an effective amount of a compound claim 1.